

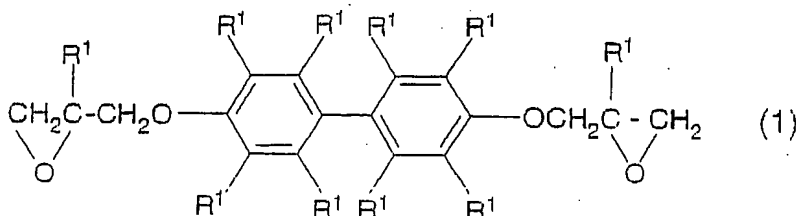
REMARKS

Claims 26-38 and 44-45 were previously pending in the application. New claims 46 and 47 are added. Therefore, claims 26-38 and 44-47 are presented for consideration. New claim 46 should be examined with the elected species of claims 34-37.

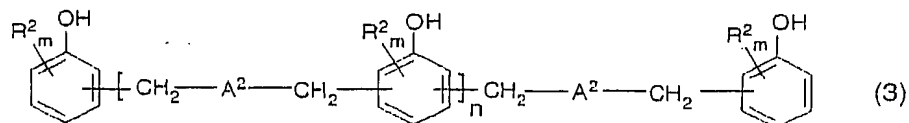
The claims as amended herein are believed to overcome the rejection under 35 USC §103(a) over TAKAMI et al. 6,054,222 in view of SHIMIZU et al. 5,854,316 for the following reasons:

TAKAMI et al. teach an epoxy resin composition that is low in stress intensity, excellent in solder reflow resistance, high in fluidity, and excellent in moldability, which composition comprises three types of silica powers with quite different particle diameters, as an inorganic filler. TAKAMI et al. provide no experimental evidence indicating that the epoxy resin composition disclosed therein would be good in flame retardance.

Specifically, TAKAMI et al. teach specifically examples of an epoxy resin composition comprising (A) epoxy resin, (B) curing agent (phenolic resin), (C) cure accelerator and (D) silica (inorganic fillers), wherein (A) epoxy resin is a biphenyl epoxy resin of the formula (1):



where the R^1 's identically or differently denote a hydrogen atom, a monovalent organic group or a halogen atom, (B) curing agent (phenolic resin) is a phenolic resin of general formula (3):



where the R^2 's identically or differently denote hydrogen atoms, monovalent organic groups or halogen atoms; A^2 is a bivalent group selected from those of benzene, biphenyl, naphthalene; m is 0 to 3; and n is 1 to 50, and (D) silica accounts for more than 85 wt% of the total amount of the epoxy resin composition, wherein said silica powder (d) is composed of:

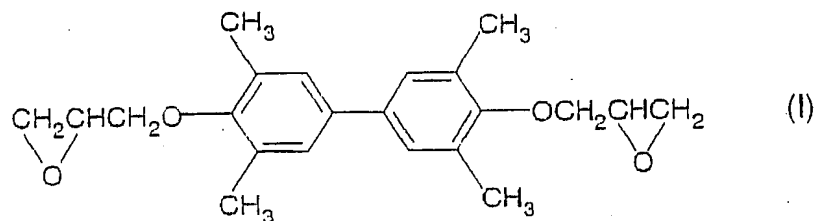
(d1) a first silica powder with a particle diameter ranging from 5 to 75 μm ;

(d2) a second silica powder with a particle diameter ranging from 0.2 to 0.9 μm ; and

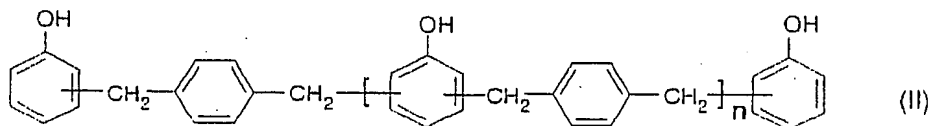
(d3) a third silica powder with a particle diameter ranging from 0.01 to 0.08 μm .

In addition, TAKAMI et al. suggest that the ratio of the epoxy equivalent of (A) epoxy resin to the hydroxyl equivalent of (B) phenolic resin should be preferably adjusted within the range of 0.5 to 1.5, more preferably of 0.8 to 1.2.

For example, in the epoxy resin composition of Examples listed in Table 1, epoxy resin I-A of bishydroxybiphenyl type epoxy resin with epoxy equivalent of 193 g/eq. and curing agent I-A of phenol aralkyl resin with hydroxyl equivalent of 170 g/eq. are utilized. The biphenyl epoxy resin I-A (epoxy equivalent: 193 g/eq.) is understood to have a structure of formula (I) shown in JP 08-253555A, SHIMIZU et al. and JP 10-182941:



The phenol aralkyl resin I-A (hydroxyl equivalent: 170 g/eq.) is understood to have a structure of formula (II) shown in JP 08-253555 and SHIMIZU et al.:

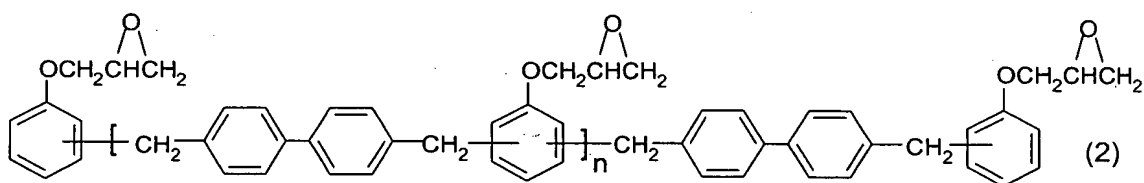


TAKAMI et al. provide no experimental evidence indicating that examples of epoxy resin compositions listed in Tables would be good in flame retardance.

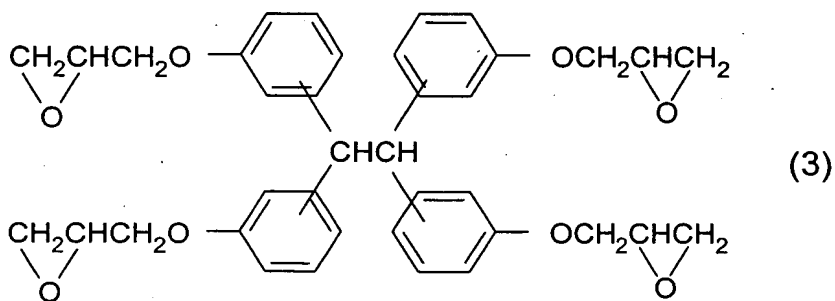
Thus, TAKAMI et al. give no clear suggestion that among examples of phenolic resin described therein, the choice of phenolic resin including biphenyl derivatives having no hydroxyl group, such as phenolbiphenylaralkyl resins of formulas (10) and

(13), is preferred to attain good flame retardancy for an epoxy resin composition comprising inorganic fillers in the content of more than 60 wt% in the total weight of the epoxy resin composition without the use of any flame retardant or flame retarding auxiliary.

Also, TAKAMI et al. give no clear suggestion that among examples of epoxy resin described therein, the choice of such a combinational mixture of a phenolbiphenylaralkyl epoxy resin represented by formula (2):



wherein $n = 0$ to 10, with a tetraphenylolthane type epoxy resin represented by formula (3):

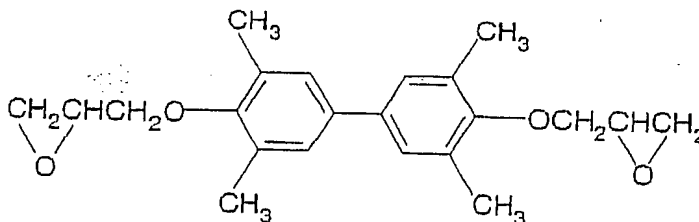


is preferred to attain good flame retardancy for an epoxy resin composition comprising inorganic fillers in the content of more than 60 wt% in the total weight of the epoxy resin composition

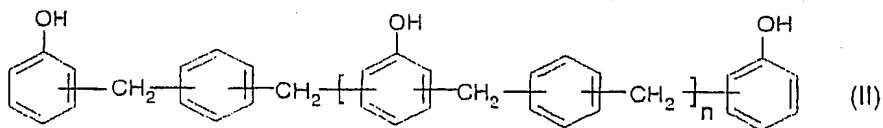
without the use of any flame retardant or flame retarding auxiliary.

SHIMIZU et al. at column 4, lines 8-16 teach that in order to fulfill the objection of good flame retardance, the content of the inorganic filler (C) in the epoxy resin compound should be 70-97 wt% and the inorganic filler (C) should contain 0.1-50 wt% of alumina.

SHIMIZU et al. clearly suggest that in the case where no alumina is used even though the amount of the inorganic filler (C) is more than 70 wt%, the epoxy resin composition would be poor in flame retardance, as shown by comparative examples (1), (2), (4) or (6) listed in Tables 1 and 2, which comprise epoxy resin II of 4,4'-bis(2,3-epoxypropyl)-3,3',5,5'-tetramethylbiphenyl:



and Hardener II (phenolic resin) of formula (II):



(where those fractions in which n in 1-3 account for about 90 wt%), without flame retardant or flame retarding auxiliary.

Therefore, SHIMIZU et al. teach nothing about how to attain good flame retardancy for an epoxy resin composition comprising inorganic fillers in the content of more than 60 wt% in the total weight of the epoxy resin composition, without the use of any flame retardant or flame retarding auxiliary when there is no amount of alumina contained in the inorganic fillers.

Typically, as summarized in Table 2 of SHIMIZU et al., the epoxy resin composition of comparative example 6 using amorphous fused silica with average particle diameter of 15 μm exhibits improved moldability (PKG filling properties) and improved solder heat resistance, but is poor in flame retardancy (i.e. V-2). In contrast, the epoxy resin composition of comparative example 8 using amorphous fused silica with average particle diameter of 15 μm exhibits improved solder heat resistance and good flame retardancy (i.e. V-0), but is poor in moldability (PKG filling properties) (i.e. voids).

In view of this, there may be somewhat good prediction that such an epoxy resin composition as I-1 to I-4 listed in Table 1 of TAKAMI et al. would be as poor in flame retardancy as the epoxy resin composition of comparative example 6 disclosed in SHIMIZU et al., even though all those epoxy resin compositions exhibit improved moldability (PKG filling properties) and improved solder heat resistance.

Therefore, the proposed combination of references would not teach or suggest a flame retardant epoxy resin composition having an inorganic filler (C) that is one or a mixture of two or more fillers selected from fillers made of fused silica, crystalline silica, or silicon nitride as recited in claim 34.

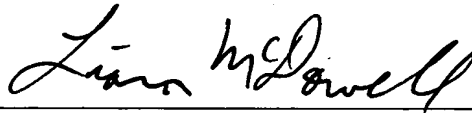
Since this limitation is found in each of the independent claims, withdrawn claims 26-33, 38, 44 and 45 should be examined and allowed.

In view of the present amendment and the foregoing remarks, it is believed that the present application has been placed in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. \$1.16 or under 37 C.F.R.\$1.17.

Respectfully submitted,

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